

DRAFT  
ENVIRONMENTAL STATEMENT

MAINTENANCE DREDGING AND  
CONTAINED DISPOSAL OF DREDGE  
MATERIALS AT GREEN BAY HARBOR, WISCONSIN

Department of the Army  
Chicago District, Corps of Engineers  
219 South Dearborn Street  
Chicago, Illinois 60604

March 1975

SUMMARY

MAINTENANCE DREDGING AND CONTAINED

DISPOSAL OF DREDGE MATERIAL AT

GREEN BAY HARBOR, WISCONSIN

(X) Draft

( ) Final Environmental  
Statement

Responsible Office:

Col. James M. Miller  
District Engineer  
US Army Engineer District,  
Chicago  
219 S. Dearborn 312-353-6400  
Chicago, Illinois 60604

1. Name of Action: (X) Administrative ( ) Legislative

2. Description of Action

The Maintenance of authorized project depths at the existing Federal Navigation Project at Green Bay Harbor is proposed to be accomplished by dredging settled sediments and shoaled sands from the channel at the project. All of the dredged material resulting from maintenance dredging over the next two years will be disposed of in the site established in 1966 for the containment of dredge material from an Army Corps of Engineer channel deepening project.

3. (A) Environmental Impacts:

These impacts include: alteration of bottom sediments; disturbance of bottom dwelling organisms; temporary increase of turbidity levels; conversion of a marshland to a terrestrial environment suitable for commercial development; displacement of marshland wildlife and plants; noise. Potential secondary impacts include: industrial effluent, perpetuation of industrial zoning; road construction; change in land values.

(B) Adverse Environmental Impacts:

The adverse impacts include: physical alteration of the sediment-water interface in the channel and adjacent areas; destruction or displacement of pollution-tolerant organisms inhabiting channels and adjacent areas; resuspension of polluted sediments with its resultant impacts; conversion of a 30 acre wetland to a terrestrial

environment resulting in destruction and displacement of marshland wildlife species.

4. Alternatives To The Proposed Action:

Potential alternatives to the proposed action include: (A) No action; (B) Dredge to a lesser depth; (C) Dredge alternatives; (D) Diking off remaining 30 acres of established disposal site and securing a new site; (E) Other sites; (F) Open lake disposal of polluted dredgings with or without advanced waste treatment; (G) Controlling source of sedimentation.

5. Comments Requested:

Environmental Protection Agency  
United States Department of Interior  
U.S. Department of Commerce  
U.S. Department of Agriculture Soil Conservation Service  
U.S. Department of Housing and Urban Development  
U.S. Department of Transportation  
United States Coast Guard  
State of Wisconsin  
Office of the Governor  
Department of Natural Resources  
Department of Local Affairs and Development  
State Historical Society of Wisconsin  
Bureau of Planning & Budget  
Bay Lakes Regional Planning Commission  
Brown County Planning Commission  
City of Green Bay  
Public Works Department  
Harbor Master  
Office of the Mayor  
Wisconsin Division of Izaak Walton League of America  
League of Women Voters  
North Midwest Region of the National Audubon Society  
Lake Michigan Federation  
Citizen Natural Resources Association of Wisconsin, Inc.  
Wisconsin Federation of Conservation Clubs  
Wisconsin Resource Conservation Council  
Wisconsin Wildlife Federation  
Midwest Representative of Sierra Club  
Great Lakes Commission

6. Draft Statement to CEQ - \_\_\_\_\_  
Final Statement to CEQ - \_\_\_\_\_

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ENVIRONMENTAL STATEMENT

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OF DREDGE MATERIALS AT GREEN BAY HARBOR, WISCONSIN

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SECTION 1  
PROJECT DESCRIPTION

GREEN BAY NAVIGATION PROJECT PRIOR TO 1966

1.01 The Federal navigation project for Green Bay, Wisconsin as it existed prior to 1966 was authorized by the Rivers and Harbors Act of 1866 and subsequent acts. It provided for:

- a. An outer harbor entrance channel about 10 miles long and 22 feet deep, varying in width from 500 feet at the outer end to 300 feet at Grassy Island. Certain widening and revetment construction was included;
- b. A channel in the Fox River 22 feet deep through the City of Green Bay up to the Chicago and North Western Railway bridge at river mile 3.3;
- c. A turning basin 22 feet deep at the mouth of the East River which enters the Fox River about a mile above the bay;
- d. A turning basin 20 feet deep above the Chicago and North Western Railway bridge; and
- e. A channel 3-1/2 miles long in the river 150 feet wide and 18 feet deep, from the Chicago and North Western Railway bridge to DePere, terminating in a turning basin.

PREVIOUS DREDGING AND DISPOSAL METHODS

1.02 Dredging was normally accomplished by a dipper dredge. Disposal was normally accomplished by loading barges with dredgings and towing them to open water areas in the Bay (primarily the dumping ground located approximately 3-1/2 miles northeast of Long Tail Point Light) where the sediments were then dumped.

HISTORY OF THE GREEN BAY NAVIGATION PROJECT FROM 1966 TO PRESENT

1.03 The Rivers and Harbors Act of 1962 authorized improvements to the existing project as follows:

- a. Deepening the entrance channel in Green Bay to 26 feet for a distance of about 11-1/4 miles from that depth in the bay to Grassy Island, at channel widths of 500 feet from deep water to Long Tail Point Light, thence 300 feet to Grassy Island;

- b. Deepening the entrance channel to 24 feet for a distance of 1.8 miles from Grassy Island to a point in the Fox River 0.5 miles upstream from the mouth, at the presently authorized channel width of 300 feet, thence deepening the Fox River to 24 feet for a distance of 3.2 miles to a point 1,700 feet upstream from the Chicago and North Western Railway bridge, at existing channel widths;
- c. Dredging the authorized but unconstructed turning basin at the mouth of the East River to a depth of 24 feet for a maximum width of 1,000 feet; and
- d. Eliminating the item of local cooperation required by the Rivers and Harbors Act of 2 March 1945 for a turning basin 22 feet deep at the mouth of the East River.

1.04 The authorization provided that local interests:

- a. Provide without cost to the United States all lands, easements, and rights-of-way required for construction and subsequent maintenance of the project and for aids to navigation upon the request of the Chief of Engineers, including suitable areas determined by the Chief of Engineers to be required in the general public interest for initial and subsequent disposal of dredge materials and necessary retaining dikes, bulkheads, and embankments therefore or the costs of such retaining works;
- b. Hold and save the United States free from damages due to the construction and maintenance of the improvements;
- c. When and where necessary, provide and maintain depths between the new channel limits and terminal facilities commensurate with related project depths; and
- d. Accomplish such alterations as required in sewer, water supply, drainage, and other utilities.

#### NEW WORK AND MAINTENANCE DREDGING

##### New Work

1.05 Dredging for the new work project commenced in 1966 and was completed in stages. Under one contract which began in 1966, a hydraulic dredge was used from the mouth of the Fox River to Long Tail Point. The contract was completed in 1967. The new work dredging from the river and the channel in the bay to Grassy Island were first bottom dumped into an 18 foot deep sump area which had been excavated east of the land disposal site in the bay, then, a pipeline dredge was used



to pump the dredgings from the sump area to the original 400 acre "Green Bay Diked Disposal Area". This diked disposal site was furnished by the City of Green Bay for dredging disposal as a local cooperation requirement under the new work deepening project authorization. The new work dredgings from Grassy Island to Long Tail Point were used to construct dikes in open water to form the "Grassy Island Disposal Area". This site was never used for dredge disposal.

#### Maintenance

1.06 During 1970 some maintenance dredging was done by the dipper dredge "Kewaunee" around the dredge docking facilities at the "Green Bay diked Disposal Area". The previously used sump area was used to contain these dredgings. From 1969-1973 the government-owned hopper dredge "Markham" excavated from Long Tail Point bayward to the existing 26 foot depth in the bay, a distance of about eight miles. 1.6 million cubic yards of these dredgings which were unpolluted were disposed of in an established open water disposal area in the bay 7 miles bayward of the then existing entrance light. An additional 2.8 million cubic yards, about half of which were unpolluted were disposed of in the established "Green Bay Diked Disposal Area". The Corps was reimbursed \$600,000 by the City of Green Bay for disposing of the unpolluted dredgings on the land disposal area. This was the differential between lake and land disposal.

1.07 During May to August 1973 the government-owned dipper dredge "Kewaunee" removed high spots along the channel areas. These new work dredgings were disposed of in the established open water disposal area. The new work deepening dredging was essentially completed in August 1973. During May-June 1973 and July-September 1974 the hopper dredge "Markham" performed maintenance dredging from the Mouth of the Fox River to Long Tail Point. These maintenance dredgings were disposed of in the established "Green Bay Diked Disposal Area". Under the diked disposal program authorized by PL 91-611, 1970, the City of Green Bay agreed to the continued use of the established site. During the summer of 1973 and early spring 1974, some maintenance dredging was done by contract in the Fox River at the Fort Howard turning basin where shoaling had become critical. Because of the limited amount of dredging required, they were disposed of in a small site along the Fox River. A portion of this contract included the cleaning out of the sump area in the bay where polluted maintenance dredgings had been previously dumped. The dredging performed in 1974 was coordinated with the U. S. Fish and Wildlife Service. During coordination, it was discovered that Forster's terns were nesting in the disposal area and it was agreed to delay disposal operations until 8 July 1974 and contain the material until 8 August 1974 at which time the terns would be sufficiently developed to escape destruction. In 1975, the dredging will be started early enough in the spring so as to discourage the terns from nesting in the disposal area.

Office File

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GREEN BAY HARBOR, WISCONSIN  
CONFINED DREDGE DISPOSAL AREA  
SITE SELECTION STUDY

January 1976

GREEN BAY HARBOR, WISCONSIN  
CONFINED DREDGE DISPOSAL AREA  
SITE SELECTION STUDY

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A	Section 123, PL 91-611
B	Report on Degree of Pollution of Bottom Sediments in Green Bay Harbor
C	Hydraulics Analysis
D	Cost Estimates
E	Photographs of Sites

1. **PURPOSE OF REPORT:** This report presents the results of analyses of the engineering, operational and environmental aspects of the various proposals and sites suggested for construction of a dredged material disposal area to contain the polluted dredgings from the Federal Navigation Project at Green Bay Harbor, Wisconsin. The report will serve as the basis for recommending a plan for containing the polluted dredgings from maintenance of this harbor.

2. **PROJECT LOCATION:** Green Bay, Wisconsin, is located at the mouth of the Fox River on the southern end of Green Bay, a major arm of Lake Michigan. The population of Green Bay is 87,809, according to the 1970 U. S. Census Bureau figures with 158,244 people residing in the Brown County area. The Brown County Planning Commission projects the county's population at 229,000 by the year 1985. The city is the commercial center for northeastern Wisconsin and a major manufacturing center of paper and paper products.

3. **WATERBORNE COMMERCE:** The total tonnage moving through Green Bay Harbor has been relatively stable from 1962 to 1973. The highest tonnage during this 12-year period was 2,875,000 tons recorded in 1967, the lowest was 2,366,000 tons in 1963, and the average was about 2,650,000 tons. A pipeline completed in 1962 reduced the 1962-1973 petroleum tonnage by 700,000 tons, from the levels recorded during the period from 1951-1961. Growth in limestone and cement tonnage, for the most part, has offset slight decreases in other traffic. The 1974 tonnage composition was as follows: (1) coal, 63 percent; (2) petroleum products, 9 percent; (3) cement, 11 percent; (4) limestone, 6 percent; and (5) other, 11 percent. In 1974 231 inbound and 82 outbound vessels had drafts of 19 feet to 26 feet and over 40 percent of these vessels had drafts exceeding 22 feet. Although over 95 percent of the tonnage moving through the harbor is inbound, the outbound represents the highest unit value commerce. The vessels presently servicing the harbor require the channel depths up to those noted in the authorized project.

4. **EXISTING PROJECT:**

a. **Authorization:** The existing Federal Navigation Project was authorized by the River and Harbor Act of 1866 and subsequent Acts.

b. **Location:** The Green Bay Harbor Navigation Project is located in the southern portion of Green Bay at the mouth of the Fox River. This area constitutes the terminus of an extensive midwestern drainage system. This system is the Fox River watershed, which drains 6,433 square miles, and the Wolf River watershed which drains 3,782 square miles. The investigated sites for the disposal of dredged material are located near the City of Green Bay, Wisconsin.

c. Description: The authorizing Acts provided for: (1) An outer harbor entrance channel about 11-1/4 miles long and 26 feet deep, varying in width from 500 feet at the outer end to 300 feet at Grassy Island; (2) a channel in the Fox River 24 feet deep through the City of Green Bay up to the Chicago and North Western Railway bridge at river mile 3.3; (3) a turning basin 24 feet deep at the mouth of the East River which enters the Fox River about a mile above the bay; (4) a turning basin 20 feet deep above the Chicago and North Western Railway bridge; and (5) a channel 3-1/2 miles long in the river 150 feet wide and 18 feet deep, from the Chicago and North Western Railway bridge to DePere, terminating in a turning basin.

d. Status: The project was completed in 1973, except for the inactive portion which consists of dredging from 150 feet downstream of the C & N.W. Ry. bridge through and to 1,700 feet upstream of the bridge.

e. Maintenance Requirements: Past experience indicates that about 140,000 cubic yards of sediment must be removed annually from the navigation channels to maintain authorized channel depths. This dredging previously was accomplished with both hopper and dipper dredges.

##### 5. CONTAINED DISPOSAL OF POLLUTED MATERIAL:

a. Authorization: Section 123 of the River and Harbors Act of 1970 (PL 91-611) authorized the construction, operation and maintenance of contained dredge disposal facilities of sufficient capacity for a period not to exceed 10 years, for materials classified as polluted by the Administrator, U. S. Environmental Protection Agency. Under this program the cost of construction and maintenance is primarily borne by the Federal Government with local interests required to provide rights-of-way and certain assurances. The design capacity is based on an estimate of the total amount of polluted material which will be dredged in a particular harbor for a period of 10 years. A copy of Section 123 of PL 91-611 is attached as Appendix A.

b. Need for Containment at Green Bay: The former Federal Water Pollution Control Administration (FWPCA) which is now known as the Environmental Protection Agency classified the bottom sediments of this harbor as moderately polluted in the entrance channel north of the angle light at Mile 5, with the remainder of the sediments in the entrance channel south of this point and the Fox River from DePere to its mouth as heavily polluted. None of the sediments are suitable for open water disposal in Green Bay or Lake Michigan. The FWPCA report dated May 1970 showing analysis of the bottom samples taken on 9 July 1969 is included as Appendix B.



c. Character of Dredged Material: Sediments are red to brown clayey silts, heavily polluted with municipal and industrial sewage wastes and have a sewage odor.

6. PREVIOUS DREDGING AND DISPOSAL METHODS:

a. Prior to 1966: Dredging was normally accomplished by a dipper dredge. Disposal was normally accomplished by loading barges with dredgings and towing them to open water areas in the Bay (primarily the dumping ground located approximately 1-1/8 miles northeast of Long Tail Point Light) where the sediments were then dumped.

b. Channel Deepening: Dredging for channel deepening commenced in 1966 and was completed in stages. Under one contract which began in 1966, a hydraulic dredge was used from the mouth of the Fox River to Long Tail Point. The contract was completed in 1967. The new work dredgings from the river and the channel in the Bay to Grassy Island were first bottom dumped into an 18-foot deep sump area which had been excavated east of the land disposal site in the Bay, then, a pipeline dredge was used to pump the dredgings from the sump area to the original 400 acre "Green Bay Diked Disposal Area" (Bayport area). This diked disposal site was furnished by the City of Green Bay for dredging disposal as a local cooperation requirement under the new work deepening project authorization. The new work dredgings from Grassy Island to Long Tail Point were used to construct dikes in open water to form the "Grassy Island Disposal Area". This site was never used for dredge disposal. One million two hundred thousand cubic yards of these dredgings which were unpolluted were disposed of in an established open water disposal area in the Bay 7 miles bayward of the then existing entrance light. An additional 2.3 million cubic yards, about half of which were unpolluted were disposed of in the established "Green Bay Diked Disposal Area". The Corps was reimbursed \$600,000 by the City of Green Bay for disposing of the unpolluted dredgings on the land disposal area. This was the differential between lake and land disposal. During May to August 1973 the Government-owned dipper dredge "Kewaunee" removed high spots along the channel areas. These new work dredgings were disposed of in the established open water disposal area. The new work deepening dredging was essentially completed in August 1973.

c. Recent Maintenance: During 1970 some maintenance dredging was done by the dipper dredge "Kewaunee" around the dredge docking facilities at the "Green Bay Diked Disposal Area". The previously used sump area was used to contain these dredgings. From 1969-1973 the Government-owned hopper dredge "Markham" excavated from Long Tail Point bayward to the existing 26 foot depth in the Bay, a distance of about eight miles. During 1973, 1974 and 1975 the hopper dredge "Markham" performed maintenance dredging from the Mouth of the Fox River to Long Tail Point. These maintenance dredgings were disposed of in the established "Green Bay Diked Disposal Area". Under the

diked disposal program authorized by PL 91-611, 1970, the City of Green Bay agreed to the continued use of the established site. During the summer of 1973 and early spring 1974, some maintenance dredging was done by contract in the Fox River at the Fort Howard turning basin where shoaling had become critical. Because of the limited amount of dredging required, they were disposed of in a small site along the Fox River. A portion of this contract included the cleaning out of the sump area in the bay where polluted maintenance dredgings had been previously dumped.

7. PROPOSED FUTURE DREDGINGS:

a. Methods: Future dredging is generally expected to be performed with a Government-owned hopper dredge. The side pumpout capability of the hopper dredge will be used to place the dredged material into the disposal area. It is expected that a Government-owned dipper dredge will occasionally be required to clean up areas not readily accessible to the hopper dredge. At these times, mechanical or hydraulic rehandling will be required to transport the dredged material from the scows into the disposal area.

b. Maintenance Dredging Volumes: Based on past experience, it is anticipated that approximately 140,000 cubic yards of sediments must be dredged annually to maintain project depths at this harbor. Therefore, over the 10-year period of this program, about 1,400,000 cubic yards of material must be dredged and confined.

c. Private Dredging: Private (Permit) dredging is expected to total about 100,000 cubic yards of material in the ten-year period. Permittees will be advised that disposal must be in a suitable confined area because of the polluted classification of the bottom materials and will be offered use of the proposed disposal facility at a fee per cubic yard, based on the proportional share of the cost of the containment structure. The permittees will probably request use of the disposal facility because of the expected unavailability of suitable disposal areas. A sufficient capacity has, therefore, been allowed for all of the expected permit dredging.

d. Containment Area Volumes: The total capacity required to contain 10 years of dredging is 1,500,000 cubic yards.

8. COORDINATION:

a. Previous coordination: Various proposals and sites have been discussed with the City of Green Bay, the Green Bay Redevelopment Authority, Brown County Port Commission, Brown County Planning Commission, Wisconsin Department of Natural Resources, U. S. Fish and Wildlife, U. S. Environmental Protection Agency, and other interested agencies and organizations.

FINAL  
ENVIRONMENTAL IMPACT STATEMENT

MAINTENANCE DREDGING AND  
CONTAINED DISPOSAL OF DREDGED  
MATERIALS AT GREEN BAY HARBOR, WISCONSIN

DEPARTMENT OF THE ARMY  
CHICAGO DISTRICT, CORPS OF ENGINEERS  
219 SOUTH DEARBORN STREET  
CHICAGO, ILLINOIS 60604

MAY 1976

## SUMMARY

### MAINTENANCE DREDGING AND CONTAINED DISPOSAL OF DREDGE MATERIAL AT GREEN BAY HARBOR, WISCONSIN

( ) Draft

(X) Final Environmental  
Statement

Responsible Office:

Col. Andrew C. Remson, Jr.  
District Engineer

US Army Engineer District,  
Chicago  
219 S. Dearborn 312-353-6400  
Chicago, Illinois 60604

1. Name of Action: (X) Administrative ( ) Legislative
2. Description of Action

The proposed project includes continued maintenance dredging of the Green Bay Navigation Project and disposal of the approximately 300,000 cubic yards of maintenance dredgings in the established "Green Bay Diked Disposal Area" up to 1977. After 1977, a new site will be used and an EIS on this new site will be prepared. No dredging is scheduled for 1976.

3. (A) Environmental Impacts:

These impacts include: alteration of bottom sediments; disturbance of bottom dwelling organisms; temporary increase of turbidity levels; conversion of a wetland to a terrestrial environment suitable for commercial development; displacement of wildlife and plants; noise. Potential secondary impacts include: industrial effluent, perpetuation of industrial zoning; road construction; change in land values.

- (B) Adverse Environmental Impacts :

The adverse impacts include: physical alteration of the sediment-water interface in the channel and adjacent areas; destruction or displacement of pollution-tolerant organisms inhabiting channels and adjacent areas; resuspension of polluted sediments with its resultant impacts; conversion of a disturbed wetland to a terrestrial environment resulting in destruction of habitat and destruction and displacement of wildlife.

4. Alternatives To The Proposed Action:

Potential alternatives to the proposed action include: (A) No action; (B) Dredge to a lesser depth; (C) Discontinue dredging and disposal until other sites are secured; (D) Dredge alternatives; (E) Diking off remaining acreage of established disposal site and securing a new site; (F) Other sites; (G) Open lake disposal of polluted dredgings with or without advanced waste treatment.

5. Comments Received:

Advisory Council on Historic Preservation  
Environmental Protection Agency  
United States Department of Interior  
U.S. Department of Commerce  
U.S. Department of Agriculture Soil Conservation Service  
U.S. Department of Transportation  
United States Coast Guard  
State of Wisconsin  
Department of Natural Resources  
Department of Business Development  
State Historical Society of Wisconsin  
Green Bay Brown County Planning Commission  
City of Green Bay  
Industrial Development Authority

6. Draft Statement to CEQ - 18 April 1975  
Final Statement to CEQ - 10 November 1976

FINAL  
ENVIRONMENTAL STATEMENT

MAINTENANCE DREDGING AND CONTAINED DISPOSAL  
OF DREDGE MATERIALS AT GREEN BAY HARBOR, WISCONSIN

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## SECTION 1 PROJECT DESCRIPTION

### GREEN BAY NAVIGATION PROJECT PRIOR TO 1966

1.01 The Federal navigation project for Green Bay, Wisconsin as it existed prior to 1966 was authorized by the Rivers and Harbors Act of 1866 and subsequent acts. It provided for:

- a. An outer harbor entrance channel about 10 miles long and 22 feet deep, varying in width from 500 feet at the outer end to 300 feet at Grassy Island. Certain widening and revetment construction was included;
- b. A channel in the Fox River 22 feet deep through the City of Green Bay up to the Chicago and North Western Railway bridge at river mile 3.3;
- c. A turning basin 22 feet deep at the mouth of the East River which enters the Fox River about a mile above the bay;
- d. A turning basin 20 feet deep above the Chicago and North Western Railway bridge; and
- e. A channel 3-1/2 miles long in the river 150 feet wide and 18 feet deep, from the Chicago and North Western Railway bridge to DePere, terminating in a turning basin.

### PREVIOUS DREDGING AND DISPOSAL METHODS

1.02 Dredging was normally accomplished by a dipper dredge. Disposal was normally accomplished by loading barges with dredgings and towing them to open water areas in the Bay (primarily the dumping ground located approximately 3-1/2 miles northeast of Long Tail Point Light) where the sediments were then dumped.

### HISTORY OF THE GREEN BAY NAVIGATION PROJECT FROM 1966 TO PRESENT

1.03 The River and Harbor Act of 1962 authorized improvements to the existing project as follows:

- a. Deepening the entrance channel in Green Bay to 26 feet for a distance of about 11-1/4 miles from that depth in the bay to Grassy Island, at channel widths of 500 feet from deep water to Long Tail Point Light, thence 300 feet to Grassy Island;

- b. Deepening the entrance channel to 24 feet for a distance of 1.8 miles from Grassy Island to a point in the Fox River 0.5 miles upstream from the mouth, at the presently authorized channel width of 300 feet, thence deepening the Fox River to 24 feet for a distance of 3.2 miles to a point 1,700 feet upstream from the Chicago and North Western Railway bridge, at existing channel widths;
- c. Dredging the authorized but inacting turning basin at the mouth of the East River to a depth of 24 feet for a maximum width of 1,000 feet; and
- d. Eliminating the item of local cooperation required by the River and Harbor Act of 2 March 1945 for a turning basin 22 feet deep at the mouth of the East River (Appendix B-2).

1.04 The authorization provided that local interests:

- a. Provide without cost to the United States all lands, easements, and rights-of-way required for construction and subsequent maintenance of the project and for aids to navigation upon the request of the Chief of Engineers, including suitable areas determined by the Chief of Engineers to be required in the general public interest for initial and subsequent disposal of dredge materials and necessary retaining dikes, bulkheads, and embankments therefore or the costs of such retaining works;
- b. Hold and save the United States free from damages due to the construction and maintenance of the improvements;
- c. When and where necessary, provide and maintain depths between the new channel limits and terminal facilities commensurate with related project depths; and
- d. Accomplish such alterations as required in sewer, water supply, drainage, and other utilities.

NEW WORK AND MAINTENANCE DREDGING

New Work

1.05 Dredging for the new work project commenced in 1966 and was completed in stages. Under the contract which began in 1966, a hydraulic dredge was used from the mouth of the Fox River to Long Tail Point. The contract was completed in 1967. The new work dredging from the river and the channel in the bay to Grassy Island were first bottom dumped into an 18 foot deep sump area which had been excavated east of the land disposal site in the bay, then, a pipeline dredge was used

to pump the dredgings from the sump area to the original 400 acre "Green Bay Diked Disposal Area". This diked disposal site was furnished by the City of Green Bay for dredging disposal as a local cooperation requirement under the new work deepening project authorization. The new work dredgings from Grassy Island to Long Tail Point were used to construct dikes in open water to form the "Grassy Island Disposal Area" although this site was never used for dredge disposal.

#### Maintenance

1.06 From 1969-1973 the government-owned hopper dredge "Markham" excavated from Long Tail Point bayward to the existing 26 foot depth in the bay, a distance of about eight miles. 1.2 million cubic yards of these dredgings which were unpolluted were disposed of in an established open water disposal area in the bay 7 miles bayward of the then existing entrance light. An additional 2.3 million cubic yards, about half of which were unpolluted were disposed of in the established "Green Bay Diked Disposal Area". The Corps was reimbursed \$600,000 by the City of Green Bay for disposing of the unpolluted dredgings on the land disposal area. This was the differential between lake and land disposal. During May to August 1973 the government-owned dipper dredge "Kewaunee" removed high spots along the channel areas. These new work dredgings were disposed of in the established open water disposal area. The new work deepening was essentially completed in August 1973.

1.07 During 1970 some maintenance dredging was done by the dipper dredge "Kewaunee" around the dredge docking facilities at the "Green Bay Diked Disposal Area". The previously used sump area was used to contain these dredgings. During 1973, 1974 and 1975 the hopper dredge "Markham" performed maintenance dredging from the Mouth of the Fox River to Long Tail Point. These maintenance dredgings were disposed of in the established "Green Bay Diked Disposal Area". Under the diked disposal program authorized by PL 91-611, 1970, the City of Green Bay agreed to the continued use of the established site. During the summer of 1973 and early spring 1974, some maintenance dredging was done by contract in the Fox River at the Fort Howard turning basin where shoaling had become critical. Because of the limited amount of dredging required, they were disposed of in a small site along the Fox River. A portion of this contract included the cleaning out of the sump area in the bay where polluted maintenance dredgings had been previously dumped. The dredging performed in 1974 was coordinated with the U. S. Fish and Wildlife Service. During coordination, it was discovered that Forster's terns (*Sterna forsteri*) were nesting in the disposal area and it was agreed to delay disposal operations until 8 July 1974 and contain the material until 8 August 1974 at which time the terns would be sufficiently developed to escape destruction. In 1975, the dredging was started early enough in the spring so as to discourage the terns from nesting in the disposal area. During the spring of 1975 approximately 200,000 cubic yards of dredgings were removed from the project by a hopper dredge and were disposed of in the manner specified by the Fish and Wildlife Service, to discourage terns from returning to the area.